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10/587,151	02/20/2007	Elio Poggiagliolmi	66455-275-7	4994
25769 7590 03/30/2010 DYKEMA GOSSETT PLLC FRANKLIN SQUARE, THIRD FLOOR WEST 1300 I STREET, NW WASHINGTON, DC 20005				
EXAMINER				
MISA, JOAN D				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,151

Applicant(s)

POGGIAGLIOLMI ET AL.

Examiner

JOAN D. MISA

Art Unit

3671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/23/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-29, 31-36, 38-48, 50-61, 64 and 65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 36, 38-48, 50-56, is/are allowed.
- 6) ☒ Claim(s) 24-29, 31-35, 57 and 59-61 is/are rejected.
- 7) ☒ Claim(s) 58, 64 and 65 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Status

Pending: 24-29, 31-36, 38-48, 50-61, 64, and 65

Rejected: 24-29, 31-35, 57, and 59-61

Objected to: 58, 64, and 65

Allowed: 36, 38-48, and 50-56.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 65 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 65 recites the limitation "a cage of bars having friction means", which was not described in the specification and is therefore considered new matter.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 64 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 64 recites the limitation "the friction reducing means" in line 2. There is insufficient antecedent basis for this limitation in the claim. Claim 64 is dependent upon claim 36, which has been amended to remove the limitation which includes the phrase "friction reducing means".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 24, 27-29, 31-35, 57, and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pellenc (FR 2,639,176), with reference to a machine translation, in view of Zehavi et al. (5,473,875), hereafter Zehavi '875.

In re claim 24, given the structure of a vibrating device for removing fruit from a plant during harvesting, the following method steps would inherently be performed when using the device disclosed by Pellenc: *the steps of connecting drive means ("verin alternatif" 38) to the plant to apply vibrations thereto, wherein the vibrations have a time-variable frequency*, as disclosed in Figure 6 and page 1, lines 25-33 and page 8, lines 9-12 and 22-24. However, Pellenc fails to disclose wherein the frequency can be controlled, sweeping the frequency of the vibrations linearly or non-linearly from an initial sweep to a final sweep.

Zehavi '875 teaches that "the range of frequencies through which the vibration units are optimally drawn is determined by the characteristics' of the tree being shaken... trees of a given type tend to exhibit natural resonance frequencies that vary only within a narrow band." (col.5, lines 25-30) Therefore to sufficiently locate the resonance frequency of a given tree, which results in the most efficient harvest when the tree is vibrated at this frequency, the control means (computer 54) vibrates the vibratory head at a varying or sweeping frequency (col.5, lines 10-34 and col.6, lines 13-14 and 19-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the control means of Pellenc to vibrate at a varying or sweeping frequency as taught by Zehavi '875, in order to sufficiently locate the resonance frequency of a given tree which results in the most efficient harvesting. Due to the modification above, the method step of *applying vibrations to the plant while sweeping the frequency of vibrations ... so as to remove the fruit from the plant* is met.

With regards to the limitation that vibrations are applied during the harvesting, as disclosed by Zehavi '875, "every tree exhibits a characteristic resonance frequency; shaking the tree at this frequency results in the maximum displacement amplitude and, consequently, the most efficient harvesting" (col.5, lines 11-14). The process of shaking the tree to obtain the frequency is considered part of the harvesting process, especially since fruit will fall during this shaking process and thus meets the limitation of "during harvesting". Further, given the teaching of Zehavi '875, it would have been well within the skill of those in this art at the time the invention was made to frequently scan the resonance frequency of a tree throughout the duration of the harvesting in order to ensure that plants are constantly shaken or vibrated at the optimum level throughout the duration, thus providing the most efficient harvesting if desired.

In re claims 27-28, the combination of Pellenc and Zehavi '875 further discloses on page 2, lines 13-21; page 8, lines 12-21; and Figure 6 of Pellenc, the method of claim 24:

- a. Per claim 27, *including measuring acceleration or displacement of the vibrations using at least one sensor* ("des capteurs magnétiques" 49a & 49b);
- b. Per claim 28, *further comprising the step of adjusting at least one of the frequency, phase, and amplitude of the vibrations in dependence on sensor measurement.*

In re claim 29, the combination further discloses the method of claim 24, *including manually adjusting at least one of the frequency, amplitude, and phase of the vibrations*, as suggested on page 10, lines 28-34 of Pellenc.

In re claims 31-34, the combination (specifically Pellenc) further discloses the device of claim 24; however, the combination does not expressly disclose the following:

- a) Per claim 31, *wherein the initial sweep frequency is higher than the final sweep frequency;*
- b) Per claim 32, *wherein the initial sweep frequency is lower than the final sweep frequency;*

Art Unit: 3671

- c) Per claim 33, *wherein the vibrations include a modulation component which has a much lower frequency than the sweep frequency; and*
- d) Per claim 34, *the step of limiting the range of frequencies of the vibrations by means of a band pass filter.*

However, given the fact of the issues known in the art as disclosed by the applicant, with the use of one single dominant frequency, the trees are prone to damage, often including substantial removal of leaves and/or twigs of the tree. It would have been obvious to vary the frequency of the vibration, according to the limitations of claims 31-34, depending on certain factors, such as the size of the tree or fruits, the time of the harvest, the ripeness of the fruits, etc., to prevent such damage to the tree and achieve high harvesting efficiency. Thus, the examiner considers that the electronic device that controls the servo valve of the device of Pellenc used to adjust the frequency and/or amplitude of the movement of the vibration head, inherently meets the limitations of claims 31-34.

In re claims 35, the combination (specifically Pellenc) discloses the method of claim 24, except for *the step of omitting frequencies from the vibrations which cause leaf detachment from the tree.* However, given that the applicant discloses that an issue with current mechanical shaking devices is that "mechanical shaking methods damage the trees and leads to the unwanted removal of leaves and small branches" (pg. 1, lines 20-21 & pg. 2, lines 2-6), it would have been obvious to one of ordinary skill in the art at the time the invention was made to omit applications of frequencies that cause leaf detachment from the tree from the vibrations since removal of leaves and small branches due to mechanical shaking methods are deemed unwanted.

In re claim 57, the combination (specifically Pellenc) discloses the combination he method of claim 24, wherein the vibrations further have at least one of a phase and an amplitude which varies with time (refer to Figure 6 and page 1, lines 25-33 and page 8, lines 9-12 and 22-24 of Pellenc).

Art Unit: 3671

In re claim 59, the combination (specifically Pellenc) discloses the method of claim 24, wherein the vibrations are controlled by electronic control means (refer to page 10, lines 11-34 of Pellenc).

In re claim 60, the combination discloses the method of claim 24, wherein the frequency of the vibrations exploits the pendulum-like non-linear resonance properties of the fruit-stem combination (col.5, lines 25-30 of Zehavi '875).

In re claim 61, the method according to claim 28, wherein said adjusting step comprises one of reducing vibration amplitude and momentarily increasing rate of change of the vibration frequency of the driving motion (page 8, lines 22-31 and page 9, lines 9-13 of Pellenc; the examiner notes that in order to achieve a minimum amplitude and maximum frequency disclosed in page 8, lines 25-31 of Pellenc, the amplitude and frequency would have to be adjusted such that the amplitude is reduced and the frequency increased).

Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pellenc in view of Zehavi '875 in view of Zehavi et al. (2004/0079065), hereafter Zehavi '065.

In re claims 25, the combination of Pellenc and Zehavi '875 discloses the method of claim 24 above, except wherein the vibrations are substantially unidirectional. Zehavi '065 discloses a method inherent in a device for removing fruit from a plant, *wherein the vibrations are substantially unidirectional*, as disclosed on page 1, paragraph 009 and 013. According to Zehavi '065, the advantage of using a unidirectional force or vibration is that optimal harvesting results can be achieved and shaking-vibration harm to the mechanical device, to the vehicle, and to the driver can be prevented (Para. 009). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the vibratory head of the device of the combination to provide a unidirectional force between the reaction mass and clamping means, as taught by Zehavi '065, in order to achieve optimal harvesting result and prevent detrimental effects on the mechanical device, the vehicle, and the driver.

In re claims 26, the combination of Pellenc, Zehavi '875 and Zehavi '065 further discloses the method of claim 24 above, *wherein the vibrations are applied to the plant substantially normally to a longitudinal axis of the plant*, as disclosed in page 1, paragraph 013 and as shown in Figure 1 of Zehavi '065, wherein the shaking direction is along the x-axis and the longitudinal axis of the plant is the axis emerging from the paper.

Allowable Subject Matter

Claim 58 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 64 and 65 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 36, 38-48, and 50-56 are allowed.

Response to Arguments

Applicant's arguments filed 4/15/2009 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references, Pellenc and Zehavi et al. '875, individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

With respect to applicant's argument on page 10 of the Remarks, that there is no disclosure of varying the frequency of the tree-shaking apparatus during harvesting, the examiner respectfully disagrees. The phrase "during harvesting" is a very broad phrase. The specification does not define what constitutes harvesting and does not define at what point harvesting begins or ends. As stated above, Zehavi et al. '875 teaches that "every tree exhibits a characteristic resonance frequency and shaking the tree at this frequency results in the maximum displacement amplitude and, consequently, the most efficient harvesting" (col.5, lines 11-14). The process of shaking the tree to obtain the frequency is

Art Unit: 3671

considered part of the harvesting process, especially since fruit will fall during this shaking process.

Accordingly, the rejection of claim 24 over the combination of Pellenc and Zehavi et al. '875 is maintained.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rau (2005/0252711) teaches a reactive mass (Figures 3 and 3A, 10A) slidably held in a cage of bars (52) - claim 36. Muller et al. (4,706,231) teaches a similar type of reaction mass (26) for a vibration device. Roessler (5,331,607) teaches a sweep frequency vibrator.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOAN D. MISA whose telephone number is (571) 270-3745. The examiner can normally be reached on Monday - Friday, 8:00am - 4:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Will can be reached on (571) 272-6998. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3671

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas B Will/
Supervisory Patent Examiner
Art Unit 3671

JDM 2/26/2010